

State of Illinois
Department of Transportation

**CONSTRUCTION INSPECTOR'S CHECKLIST
FOR
EARTH EXCAVATION AND EMBANKMENT**

This checklist has been prepared to provide for the field inspector a summary of easy-to-read step-by-step requirements relative to the proper construction of all earthwork (Section 200). The following questions are based on information found in Standard Specifications, Project Procedures Guide, Construction Manual and current policy memorandums and letters.

Have you checked the contract Special Provisions, Supplemental Specifications and plans to see if any modifications have been made to the requirements listed herein? _____

1. PRELIMINARY STAKES AND MEASUREMENTS

Prior to the moving of any earth have you:

- a. Cross sectioned all borrow and rock excavation sites?
(202.07 (b) & 204.07) _____
- b. Cross sectioned all earth excavation, channel excavation, and top soil excavation sites which plan quantity acceptance
(Form [BC 981](#)) has not been agreed upon?
(202.07(b), 203.05, 211.07(b)) _____
- c. Cross sectioned all proposed embankment sites to re-establish the ground surface, if the contractor so requested. _____
- d. Slope staked for both cuts and fills at 25 m (100 feet) for rural and 10 m (50 feet) urban intervals left and right of centerline? _____
- e. Have you determined the minimum tree and plant material needed to be removed then:

Measured and marked for removal necessary trees (201.04) _____

Delineated and protected as needed plant material to be saved (201.05) _____

2. EROSION CONTROL

- a. Prior to moving any earth have you:
- (1) Reviewed the project Erosion Control and Storm Water Pollution Prevention Plan? _____
 - (2) If applicable, reviewed the U. S. Army Corps of Engineers Permit Conditions? _____
 - (3) Conducted a field review of all potentially erodable areas with the Contractor? _____
 - (4) Recorded the field review date and attendees in the project diary? _____
 - (5) Recorded locations and types of erosion control recommendations on a set of plans or by memorandum, etc.? _____
- b. Have you reviewed the "Commitment File"? _____
- c. Are you directing the Contractor to construct all permanent erosion control features as soon as practical? (107.23) _____
- d. Are you ordering temporary erosion control systems to be installed to control erosion? (280.01) _____
- e. Is the Contractor taking sufficient precautions to prevent pollution and siltation of streams, lakes, reservoirs and adjacent properties? (107.23) (C.M. 60) _____
- f. Are you reviewing the erosion controls and ordering repairs and additional measures as necessary? _____
- g. Maintenance of installed temporary erosion control systems and the installation of additional temporary erosion control systems not provided for in the plans will be paid for in accordance with Art. 109.04. EXCEPT:
- (1) Erosion control at Contractor-furnished borrow pits, storage and plant sites, and haul roads will not be paid for. _____
 - (2) Erosion control required because of negligence or carelessness on the part of the Contractor will not be paid for. _____

3. CLEARING

Is the Contractor removing and disposing of all obstructions such as fences, walls, foundations, buildings, accumulations of rubbish, existing structures (excluding established pay items), all logs, shrubs, brush, grass, weeds, other vegetation and stumps of less diameter than 150 mm (6 inches)? Clearing shall be restricted to the minimum necessary to construct the project. (201.01(a))

4. TREE, SHRUB, BUSH AND ROOT REMOVAL

- a. Are all trees (and stumps), bushes and roots within the slope limits of embankment 600 mm (2 feet) or more in depth being cut off at ground level? (201.04 & 201.08)

- b. Are all other trees, stumps, saplings, bushes and roots within the right-of-way (excluding those designated to be saved) being removed to a depth of not less than 300 mm (12 inches) below the elevation of the subgrade, the finished earth surface, or the ground line? (201.04 & 201.08)

- c. **If the Contractor elects to burn the organic waste, is it being done in accordance with the IEPA open burning permit? Is the IEPA being notified within one working day of citizen complaints? Is non-compliance being reported to your Supervisor? All burning under the Department Open Burn Permit must be performed within Project R.O.W.**

- d. **Is a completed and signed Notice of Open Burn Form being provided to the IEPA not less than seven working days prior to each burn?**

5. TOP SOIL EXCAVATION

- a. Is the Contractor obtaining top soil from only the locations and to the depths designated on the plans? (211.03)

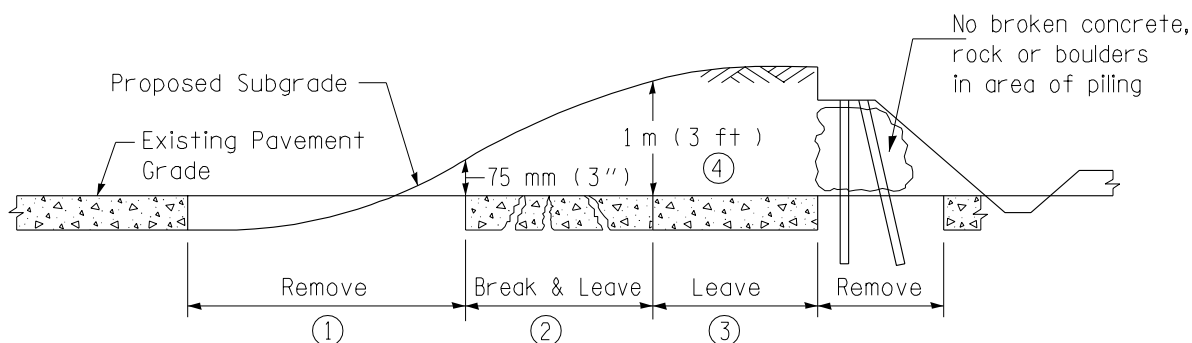
- b. Is the top soil being stock-piled at locations approved by the Engineer? (211.03)

- c. Is the appropriate erosion control system, (i.e. temporary seeding) being applied to the topsoil stockpiles?

- d. If the Contractor is required to furnish any additional top soil (1081.05) from outside the ROW, is it being approved first? (211.03)

6. PREPARATION OF EXISTING GROUND SURFACE

- a. After all embankment sites are cleared, is the top 300 mm (6 inches) of the ground surface being disked and then compacted to the satisfaction of the Engineer? (205.03) _____
- b. If embankments are constructed during the winter, is all snow, ice and frozen earth being removed from the area to be covered by the embankment? (205.03) _____
- c. When construction is resumed after any winter shutdown period, is the top 200 mm (8 inches) of all partially completed embankments reprocessed and recompactd to the minimum specified density before allowing the Contractor to place more fill? (205.03) _____
- d. Where embankment material is being placed against a hillside, sloped surface, or existing embankment, is the existing slope being plowed deeply, or benched or stepped to eliminate the possibility of a shear plane being built into the fill? (205.03) _____
- e. Where building embankments over existing Full-Depth Bituminous, PCC Base Course or PCC Pavement, remove, break or leave existing pavement as follows: (205.03(b)) _____



- ① less than 75 mm cover (less than 3" cover) ② 0.3 m² max. pcs. 75 mm - 1 m cover (3 sq ft max. pcs. 3" - 3 ft cover) ③ over 1 m cover (over 3 ft cover) ④ 0.2 m² (2 sq ft) max. pcs. in fill

7. EMBANKMENT

- a. Is each layer of embankment material being leveled to not more than 200 mm (8 inches), loose condition, prior to compaction? (205.04(a)) _____
- b. Is each layer of embankment material being placed and compacted the entire width and length of the fill area so far as practicable before beginning another lift? (205.04(a)) _____

- c. Is the embankment within the area of the roadbed free of sod, frost, or other material which might cause settlement if allowed to remain? (205.04(a)) _____
- d. Is all broken concrete 0.2 m² (2 sf max. area), rock or stone (any size) being placed and adequately distributed in embankments? (202.03 & 205.04(a)) _____
- e. Are you making progress payments in accordance with the Documentation Guide? _____

8. **LOADS ON PIPES**

Has the contractor informed you which heavy equipment will need to cross over pipe or box culverts on the contract

- a. Is earth cover over pipes sufficient to prevent damage from heavy loads? (542.04(g), Table III) _____
- b. Is earth cover built to proper configuration to prevent damage from impact and wide enough to provide for two-way traffic? (542.04(g)) _____

9. **EQUIPMENT ON PAVEMENT**

Has the contractor informed you what equipment will need to operate on existing pavements on the contract, and where they intend to cross?

Is any of the Contractor's equipment that exceeds legal load limits prohibited from operating on pavements except at specified crossing locations or as allowed by permit? (107.16) _____

10. **PLACING MATERIAL AT STRUCTURES**

- a. If embankment is being placed at structures or culverts that have not been completed, is a gap of not less than 30 m (100 feet) being left on each side of the structure or culvert? (205.04(b)) _____
- b. Is embankment that is to be placed behind completed bridge abutments or around structures not being placed until a concrete beam break of at least 4500 kPa (650 psi) or a concrete cylinder strength of at least 24,100 kPa (3500 psi) is obtained and also until at least 7 days after the final concrete was placed? (205.04(b)) _____
- c. At closed abutments, culverts, or retaining walls, is all water and mud which causes excessive hydraulic pressures, and loose material which causes excessive earth pressures, removed before placing any backfill? (205.04(b)) _____

- d. In areas where the mechanical compaction equipment cannot adequately operate, is the backfill placed in 200 mm (8-inch) loose measurement layers and compacted with suitable mechanical hand tools? (205.05) _____
- e. Are density tests being taken in the hand compacted areas to be sure that the required density is obtained and to make sure that the moisture content does not exceed 110% of optimum? (205.05) _____
- f. Is a cubical deposit (600 mm x 600 mm x 600 mm (2' x 2' x 2')) of porous course aggregate (Gradation CA 5, 7, or 11 (1004.01)) completely enclosed within a fabric envelope being deposited behind each drain hole with the backfill operations? (205.04(b)) & (502.10) _____

11. DRAINAGE (202.05)

- a. Is the Contractor constructing all cuts and fills in such a manner to preclude water pockets? (202.05) _____
- b. At those locations where erosion may be a problem, are you instructing the Contractor to excavate a ditch at the toe of slope of fills and at the top of slope of cuts? (202.05) _____
- c. Are all existing tile drains, sewers and other subsurface drains being preserved and protected? (202.05) _____
- d. Are you re-directing clean water, as practicable, away from areas bare earth _____
- e. Are you reviewing drainage areas throughout the project to ensure compliance with SWPPP and Permits? _____

12. UTILITIES (105.07) & (107.31)

Is the Contractor having utilities field located and taking measures to protect the markings and facilities in an effort to avoid damage and disruption of service? (Construction [Memorandum No. 57](#)) _____

13. SURPLUS, UNSTABLE, AND UNSUITABLE MATERIAL REMOVAL AND DISPOSAL

- a. Is all rubbish, and unsuitable materials being disposed of in such a manner that public or private property will not be damaged or endangered? (202.03) _____
- b. If unsuitable material is present at or below the finished grade, is it being removed and replaced with suitable material? (202.03) _____
- c. If unstable conditions are found at grade in cut sections, is remediation of the subgrade performed in accordance with Article 301.03? _____

14. COMPACTION EQUIPMENT

- a. Is the Contractor's compacting equipment and compacting operations being coordinated with the rate of placing embankment so that the required density is obtained? (205.05) _____
- b. Is a tandem disk (1101.02) being used on each layer of material? Disking may be omitted if the fill material consists of sand, gravel, rock or broken pavement. (205.05) _____

15. COMPACTION

- a. Is the embankment being compacted to the following minimum densities? (205.05) _____

<u>Proposed Embankment Height</u>	<u>Minimum Standard Laboratory Density</u>
Lessn than 450 mm (1.5 feet)	All lifts, 95%
450 mm (1.5 feet) to 900 mm (3 feet)	1. First lift, 90% 2. Remaining lifts, 95%
Over 900 mm (3 feet)	1. Lower $\frac{1}{3}$ of fill (but not to exceed 600 mm (2 feet), 90% 2. Next 300 mm (1 foot) of fill, 93% 3. Balance of fill, 95%

- b. Are you performing job control in-place density tests within the following intervals: (Sampling Schedule I, PPG) _____

SAMPLING SCHEDULE 1: EMBANKMENTS, SUBGRADES, AND GRANULAR COURSES

MATERIAL	SPECIFICATION REFERENCE	PROPERTY/QUALITY	FREQUENCY	MISTIC TEST	FORM
Earth, Stone, or Gravel Embankments	Art. 205.05*	Standard Moisture Density Control Curve	Compaction curve data is required for each major change in embankment material. This data may be furnished in advance by District Laboratory		No standard report.
	Art. 205.05*	Density	1 test per 20,000 cu. yd. (15,500 cu. m) for a continuous operation, by Project Inspector. In confined areas, 1 test per 3 ft. (1 m) of lift and not less than 1 test per fill area, by Project Inspector	PRO	MI 701
Subgrades Subgrade	Art. 301.03*	Density	1 test per 1500 ft. (450 m) of entire length of subgrade through both cut and fill areas, by Project Inspector	PRO	MI 701
	Art. 302.08*	Density	1 test per 1500 ft. (450 m) of treated area, by Project Inspector	PRO	MI 701
	Sec. 1012	Various	Minimum of 1 sample on 1 st day, and then 1 sample per 750 tons (750 m ton) thereafter, by District Inspector	INV	LM-6
Granular Courses Base Course and Granular Embankment, Type A	Art. 351.05*	Density	1 test per 1000 ft. (300 m) of pavement, by Project Inspector	PRO	MI 701
	Art. 311.05*				
	Art. 402.05*				

* Test information contained in the Manual of Test Procedures for Materials.

c. Is the top 600 mm (2 feet) of all embankments at not more than 120 percent of the optimum moisture? (The Contractor can use an approved additive at no additional cost to the contract to effect a quicker drying time.) (205.05) _____

d. Are you recording all density tests? _____

Note: A low density test must be reported and cross-referenced to a retest after recompaction.

e. Are you directing the contractor to correct (redisk, and/or sprinkle, and recompact) all lifts on which density is not obtained?, (205.05) _____

16. ROCK EXCAVATION

Is all material which is classified as rock (202.04) being excavated to a minimum depth of 75 mm (3 inches) below the elevation of the proposed subgrade within the limits of the roadbed, and backfilled with subbase granular material? (202.03) (Maximum payment for rock excavation is 150 mm (6 inches) below plan subgrade and 150 mm (6 inches) beyond neat slope lines. 202.07(b)) _____

17. CHANNEL EXCAVATION

a. Is the Contractor's channel excavation to the lines, grades and dimensions shown on the plans? (203.04) _____

b. Is the Contractor notifying you at least 3 days before starting so that you can measure tree and hedge removal and take original cross sections if required? (203.04) _____

18. BORROW and FURNISHED EXCAVATION

ALL requirements for BORROW EXCAVATION sites also apply to all FURNISHED EXCAVATION sites.

a. Is the site location, excavation plan, and material approved by the engineer in writing before the Contractor starts performing the work for borrow excavation or furnished excavation until? (204.02) & (107.22) _____

b. Tree and hedge removal in Contractor furnished borrow pits are NOT measured for payment. (201.10(b)(3)) _____

c. Are borrow pits located at least 15 m (50 ft) or 3 m (10 ft) plus 1 1/2 times the depth of excavation, whichever is the greater, from any highway ROW (except for points above pavement elevation) and are the slopes excavated in accordance with 204.02? _____

- d. Are borrow sites, any portion of which is located within 45m (150 ft) of any highway ROW submitted in accordance with Article 204.02? _____
- e. Are all borrow sites being seeded with the proper application of , fertilizer and/or ground limestone at the rates specified by the engineer at the Contractor's expense? (204.02) _____
 - (1) Seeding, etc., is not required if the borrow site is to be tilled. (The Contractor is to furnish a written statement from the owner.) (204.02) _____
 - (2) Seeding, etc., is not required below proposed water level if the borrow site is to be developed as a pond or lake. (204.02) _____

19. WASTE

Is the Contractor being allowed to waste suitable excess excavated material off the ROW only when shown on the plans or permission in writing is given by the Engineer? (202.03) _____

20. TOP SOIL PLACEMENT

- a. Prior to top soil placement, has the area to be covered been shaped, trimmed and finished? If the surface is eroded due to weathering, has it been filled or smoothed? If the surface is hardened or crusted has it first been disked or raked? (211.04) _____
- b. Is the Contractor applying the top soil to the slopes designated on the plans? (211.04) _____
- c. Are you periodically checking the thickness of the in place top soil with hand dug holes? (211.04) _____

21. FINAL SHAPING, TRIMMING AND FINISHING

After all cuts, fills and ditches are constructed and prior to seeding, is the Contractor performing the following operations at no additional cost to the contract:

- a. Are the ditches being cleaned and the entire roadway being shaped, trimmed and finished uniformly to the lines, grades and cross sections shown on the plans? (212.02, 212.03 & 212.04) _____
- b. Is all unsuitable material, debris, and rubbish, and all stones or boulders more than 75 mm (3 inches) in largest dimension being removed from the ROW and disposed of? (212.05) _____

22. DOCUMENTATION OF FINAL CONTRACT QUANTITIES

- a. If the contractor and the engineer have agreed in writing, (BC 981), prior to the start of the excavation that plan quantities are acceptable, no measurements will be required for the following items. If an error or revision is later found, measurements for only the affected area will be required.

1. EARTH EXCAVATION, CHANNEL EXCAVATION, ROCK EXCAVATION IN CHANNEL, FURNISHED EXCAVATION, TOPSOIL EXCAVATION AND PLACEMENT- Cu. Meter (Cu Yd.)
2. TOP SOIL FURNISH AND PLACE - Sq. Meter (Sq. Yd.)

In the absence of a signed BC 981, documentation shall be provided as follows:

- b. If the contractor AND the engineer cannot agree to the accuracy of the plan items and for Borrow Excavation, the following documentation is required:

1. BORROW EXCAVATION, ROCK EXCAVATION, EARTH EXCAVATION, CHANNEL EXCAVATION, ROCK EXCAVATION IN CHANNEL, TOPSOIL EXCAVATION AND PLACEMENT - Cu. Meter (Cu. Yd.)

Cross sections shall be taken both before and after the excavation and the volume determined by the method of average end areas. Computer results may be used in place of computations.

2. FURNISHED EXCAVATION Cu. Meter (Cu. Yd.)

Cross sections shall be taken both before and after the construction of the embankment and the volume determined by the method of average end areas. Computer results may be used in place of computations. Volume is the total completed earthwork less the volume of suitable excavated earth from within the project limits multiplied by (1- a Soil shrinkage factor) or (1- 0.25 (if a project specific soil shrinkage factor is not provided)).

Furnished Ex = Embankment Volume – Suitable Earth (1 – SF)

3. TOP SOIL FURNISH AND PLACE- Sq. Meter (Sq. Yd.)

Surface measurements of all authorized areas, depth checks and calculations are required.

Revised to conform with the
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Adopted January 1, 2002